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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/535,334	08/21/2006	Guolin Xu	P/2778-63	3718

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EXAMINER	
BARNHART, LORA ELIZABETH	

ART UNIT	PAPER NUMBER
1651	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/535,334	XU ET AL.	
	Examiner	Art Unit	
	Lora E. Barnhart	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7,15,17-23,27,31,32,35-37 and 39* is/are pending in the application.

4a) Of the above claim(s) *1-5,7,35-37 and 39* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15,17-23,27,31 and 32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/18/05, 3/24/06, 12/31/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-5, 7, 15, 17-23, 27, 31, 32, 35-37, and 39 as recited in the 5/18/05 preliminary amendment are currently pending.

Election/Restrictions

Applicant's election without traverse of Group II, claims 15, 17-23, 27, 31, and 32, in the reply filed on 2/10/09 is acknowledged. Claims 1-5, 7, 35-37, and 39 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 2/10/09.

Applicant's election without traverse of the species "protease" in the 2/10/09 reply is also acknowledged.

Examination on the merits will commence on claims 15, 17-23, 27, 31, and 32 as they read on the elected species, where applicable.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 15, 17-23, 27, 31, and 32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. **In addressing the indefiniteness rejections, applicant is reminded that the claims are drawn to a device, not to any method of using the same.**

The language of a claim must make it clear what subject matter the claim encompasses to adequately delineate its "metes and bounds." See, e.g., *In re Hammack*, 427 F 2d. 1378, 1382, 166 USPQ 204, 208 (CCPA 1970); *In re Venezia* 530 F 2d. 956, 958, 189 USPQ 149, 151 (CCPA 1976); *In re Goffe*, 526 F 2d. 1393, 1397, 188 USPQ 131, 135 (CCPA 1975); *In re Watson*, 517 F 2d. 465, 477, 186 USPQ 11, 20 (CCPA 1975); and *In re Knowlton,* 481 F 2d. 1357, 1366, 178 USPQ 486, 492 (CCPA 1973). The courts have also indicated that before claimed subject matter can properly be compared to the prior art, it is essential to know what the claims do in fact cover. See, e.g., *In re Steele*, 305 F 2d. 859, 134 USPQ 292 (CCPA 1962); *In re Moore*, 439 F 2d. 1232, 169 USPQ 236 (CCPA 1969); and *In re Merat*, 519 F 2d. 1390, 186 USPQ 471 (CCPA 1975). In this case, the claims are nearly so indefinite as to preclude a substantive search by the examiner, because they do not clearly limit the structural and physical properties of the components of the device. Statements of intended use (e.g., "for incubation of a mixture") on their own cannot limit the scope of the device. See M.P.E.P. § 2111.02. Compositions are defined by their physical, structural, and chemical properties, not by an intended use or application.

Claim 15 is drawn to a device comprising "an enzymolytic tissue dissociation chamber," which is confusing. The word "enzymolytic" is not a term of art (see the Merriam-Webster Online Medical Dictionary, hosted by the National Library of Medicine; http://www.nlm.nih.gov/medlineplus/mplusdictionary.html, attached as reference U). Furthermore, it is not clear whether this word applies to the tissue, the dissociation, or

the chamber. Clarification is required. Claims 17, 19, 22, and 23 also recite this term and therefore suffer similar deficiencies.

Claim 15 is incomplete in that it omits essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: A connection between the "tissue disruption chamber" and the "tissue disruption channel." Furthermore, claims 17, 18, and 19 require that additional chambers be present, but the claims do not indicate how these chambers are connected to each other or to the chamber and channel of claim 15. Indeed, claim 19 allows that a "chamber" can act as a "channel." Claim 20 requires that the "tissue disruption channel" of claim 15 comprise an inlet port and an outlet port, but the claim does not indicate how these ports connect, if at all, to any other recited or unrecited components of the device. Claim 19 generally requires that the chambers be "connected to each other," but the structural configuration of this connection is not pointed out. Clarification is required. The claims should particularly point out the physical and structural properties of the claimed device such that the metes and bounds are clearly established.

Because claims 17-23, 27, 31, and 32 depend from indefinite claim 1 and do not clarify the point of confusion, they must also be rejected under 35 U.S.C. 112, second paragraph.

Claim 17 requires that the second chamber "act" as a tissue disruption channel, which is confusing because it appears to be an improper attempt to introduce method steps into the claims. Clarification is required.

Claim 18 recites the limitation "the isolated cells," which is confusing because claim 15 does not recite isolated cells. Again, claim 18 implies method steps. Clarification is required.

Claim 19 requires a second chamber "acting as a tissue disruption channel," but this limitation appears to introduce a method step, which is improper. The claim does not indicate the structural or physical properties of the channel or its contents.

Claim 19 requires that the third chamber comprise a "lytic solution," but the claim does not indicate what is being lysed. The scope of the "lytic solution" is not clear.

Claim 21 refers to "the overall cross-sectional area of the disruption channel," but it is not clear whether "overall area" refers to "average area," "total area," "largest area," or some other measurement. Clarification is required.

Claim 22 requires that the chamber of claim 15 "accepts" an enzyme and a tissue sample, which is confusing because the claims are drawn to a device. The limitations of claim 22 imply method steps. Clarification is required. If claim 22 is intended to require that the chamber of claim 15 comprise an enzyme and tissue sample, the claim should so recite.

The language of claim 23 is queried, because it requires that the chamber of claim 15 "is less than 100μL in volume," rather than requiring that the volume of the chamber have this limit.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 15, 17, 18, 20-22, 27, 31, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Findlay et al. (1993, *Clinical Chemistry* 39: 1927-1933; reference V). The claims are interpreted as being drawn to a device comprising up to 5 chambers and channels connecting the chambers to each other. Some claims require that that one of the channels comprise inlet and outlet ports. Some claims require that the device be microscale and/or automated.

Findlay teaches a microfluidics device with various chambers connected to each other by channels (Figure 5). Findlay teaches that the device may be employed in automated (Figure 6; page 1931, column 2) and is disposable (Figure 5).

M.P.E.P. § 2111.02 reads, "If the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction." Compositions are defined by their physical, structural, and chemical properties, not by an intended use or application.

As discussed above in the rejections under 35 U.S.C. § 112, second paragraph, the limitations describing the intended use of each chamber ("tissue dissociation

chamber," "tissue disruption channel") do not particularly limit the physical scope of those components. The claims do not require that the tissue dissociation chamber comprise any means or reagents for dissociating tissue.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 15, 17-23, 27, 31, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Findlay et al. (1993, *Clinical Chemistry* 39: 1927-1933) taken in view of Bjornson et al. (2001, U.S. Patent 6,284,113; reference A). The claims are interpreted as being drawn to a device comprising numerous chambers and channels. Claim 19 requires that one chamber comprise a lytic solution. Claim 23 requires that one of the chambers be less than 100μL in volume.

Findlay teaches a microfluidics device with various chambers connected to each other by channels (Figure 5). Findlay teaches that the device may be employed in automated (Figure 6; page 1931, column 2) and is disposable (Figure 5).

Findlay does not teach including a lytic solution in any chamber of the device. Findlay does not particularly teach that a chamber is less than 100μL in volume. Findlay does not teach a MEMS device.

Bjornson teaches microfluidics devices for testing and processing mammalian tissue and fluid samples (column 27, lines 1-14) with enzymes or lysis solutions (column 30, line 56, through column 31, line 14). The channels and chambers in the device of Bjornson may have any shape and size (column 20, line 66, through column 21, line 35) in the microliter range (column 24, lines 52-54). The device of Bjornson may comprise electrodes for control by a computer (column 20, lines 46-53).

A person of ordinary skill in the art would have had a reasonable expectation of success in placing the lytic solution of Bjornson into one of the chambers in the device of Findlay because Bjornson teaches that microfluidics devices may comprise such solutions. The skilled artisan would have been motivated to combine the teachings of Bjornson and Findlay because Bjornson teaches that microfluidics devices may be used to contact small quantities of tissue samples with lytic solutions. It is further noted that Findlay teaches including enzymes (Taq polymerase) in the device, indicating that the device of Findlay is compatible with enzymes.

The person of ordinary skill in the art would have had a further reasonable expectation of success in including electrodes as suggested by Bjornson in the device

of Findlay because Bjornson teaches using MEMS technology for automating analysis with microfluidics devices. The skilled artisan would have been motivated to include such computer controls in the device of Findlay because Findlay teaches automated analysis of the device.

The selection of the size and shape of each of the chambers and channels in the device of Findlay would have been a routine matter of optimization on the part of the artisan of ordinary skill, said artisan recognizing that Bjornson teaches that the sizes of these chambers in microfluidics devices may be varied as desired. A holding of obviousness over the cited claims is therefore clearly required.

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was made to add a lytic solution (e.g. enzymes) and MEMS electrodes to the device of Findlay because Bjornson teaches including these elements in microfluidics devices. It would have been further obvious to a person of ordinary skill in the art at the time the invention was made to modify the size and shape of the chambers and channels in the device of Findlay because such modifications are suggested by Bjornson.

M.P.E.P. § 2111.02 reads, "If the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction." Compositions are defined by their physical, structural, and chemical properties, not by an intended use or application.

As discussed above in the rejections under 35 U.S.C. § 112, second paragraph, the limitations describing the intended use of each chamber ("tissue dissociation chamber," "tissue disruption channel") do not particularly limit the physical scope of those components. The claims do not require that the tissue dissociation chamber comprise any means or reagents for dissociating tissue.

Therefore, the claimed invention as a whole would have been *prima facie* obvious to a person of ordinary skill at the time the invention was made.

No claims are allowed. No claims are free of the art.

Applicant is requested to specifically point out the support for any amendments made to the disclosure in response to this Office action, including the claims (MPEP 714.02 and 2163.06). In doing so, applicant is requested to refer to pages and line numbers in the as-filed specification, **not** the published application. Due to the procedure outlined in MPEP § 2163.06 for interpreting claims, it is noted that other art may be applicable under 35 U.S.C. § 102 or 35 U.S.C. § 103(a) once the aforementioned issue(s) is/are addressed.

Applicant is requested to provide a list of all copending U.S. applications that set forth similar subject matter to the present claims and share an inventor or assignee with the instant application. A copy of such copending claims is requested in response to this Office action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lora E. Barnhart whose telephone number is 571-272-1928. The examiner can normally be reached on Monday-Thursday, 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lora E Barnhart/
Primary Examiner, Art Unit 1651